

In the Claims:

Please cancel claims 7-9, 14, 15 and 23-40 without prejudice, amend claims 1-6, 10, 12, 13 and 16, and add claim 41-67 as follows.

1. (Currently Amended). A nucleic acid molecule that comprises a coding sequence operably linked to regulatory elements, wherein said coding sequence that encodes a ~~An~~ isolated protein that comprises at least one of 80V, 80tm and 80ct and is free of 80C;

wherein said protein comprises either 80V or 86V or both and optionally comprises one or more of 86C, 80tm, 86tm, 80ct and 86ct wherein:

80V is the variable domain of CD80 or a functional fragment thereof;

86V is the variable domain of CD86 or a functional fragment thereof;

86C is the C domain of CD86 or a functional fragment thereof;

80tm is the transmembrane region of CD80 or a functional fragment thereof;

86tm is the transmembrane region of CD86 or a functional fragment thereof;

80ct is the cytoplasmic tail of CD80 or a functional fragment thereof; and

86ct is the cytoplasmic tail of CD86 or a functional fragment thereof.

2. (Currently Amended). The ~~nucleic acid molecule~~ ~~isolated protein~~ of claim 1 wherein said coding sequence that encodes a protein that comprises either 80V or 86V or both and optionally comprises one or more of 86C, 80tm, 86tm, 80ct and 86ct wherein:

80V is the variable domain of CD80;

86V is the variable domain of CD86;

86C is the C domain of CD86

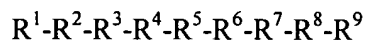
80tm is the transmembrane region of CD80;

86tm is the transmembrane region of CD86;

80ct is the cytoplasmic tail of CD80; and

86ct is the cytoplasmic tail of CD86.

3. (Currently Amended). The nucleic acid molecule ~~isolated protein~~ of claim 1 wherein said coding sequence that encodes a protein has ~~having~~ the formula:



wherein

R^1 is 0-50 amino acids;

R^2 is 80V or 86V;

R^3 is 0-50 amino acids;

R^4 is 86C or 0 amino acids;

R^5 is 0-50 amino acids;

R^6 is 80tm or 86tm;

R^7 is 0-50 amino acids;

R^8 is 80ct or 86ct; and

R^9 is 0-50 amino acids.

4. (Currently Amended). The nucleic acid molecule ~~isolated protein~~ of claim 3 wherein said coding sequence that encodes a protein has ~~having~~ the formula:

R^1 is 0-25 amino acids;

R^3 is 0-25 amino acids;

R^5 is 0-25 amino acids;

R^7 is 0-25 amino acids; and

R^9 is 0-25 amino acids.

5. (Currently Amended). The nucleic acid molecule ~~isolated protein~~ of claim 3 wherein said coding sequence that encodes a protein has ~~having~~ the formula:

R^1 is 0-10 amino acids;

R^3 is 0-10 amino acids;

R^5 is 0-10 amino acids;

R^7 is 0-10 amino acids; and

R^9 is 0-10 amino acids.

6. (Currently Amended). The nucleic acid molecule ~~protein~~ of claim 1 wherein said coding sequence that encodes a protein has ~~having~~ the formula selected from the group consisting of:

80V/dele/80tm/80ct; 80V/dele/80tm/86ct; 80V/dele/86tm/80ct; 86V/dele/80tm/80ct;
86V/dele/80tm/86ct; 86V/dele/86tm/80ct; 80V/dele/86tm/86ct; 80V/86C/80tm/80ct;
80V/86C/80tm/86ct; 80V/86C/86tm/80ct; 86V/86C/80tm/80ct; 86V/86C/80tm/86ct;
86V/86C/86tm/80ct; 80V/86C/86tm/86ct; 80V/dele/80tm/dele; 80V/dele/86tm/dele;
86V/dele/80tm/dele; 80V/86C/80tm/dele; 80V/86C/86tm/dele; 86V/86C/80tm/dele;
86V/86C/80tm/dele; 86V/86C/dele/80ct; 80V/86C/dele/80ct; 80V/dele/dele/80ct;
86V/dele/dele/80ct; 80V/86C/dele/dele; and 80V.

7-9. Cancelled

10. (Currently Amended). A plasmid comprising a nucleic molecule of claim 1. ~~9~~.

11. (Original). A plasmid of claim 10 further comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

12. (Currently Amended). A composition comprising a plasmid of claim ~~claims~~ 10 ~~or 11~~ further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

13. (Currently Amended). A recombinant vaccine or attenuated vaccine comprising composition comprising a nucleic acid molecule of claim 1. ~~9~~.

14-15. Cancelled

Docket No.: UPAP0013-100 (L2039)
PATENT

Appl. Number: 09/980,762
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16. (Currently Amended). A methods immunizing an individual against an immunogen comprising administering a composition comprising nucleic acid molecules ~~compositions~~ according to claim 1. ~~any of claims 1-15.~~

17. (Original). The method of claim 16 wherein said immunization is prophylactic.

18. (Original). The method of claim 16 wherein said immunization is therapeutic.

19. (Original). The method of claim 16 wherein said immunogen is an allergen.

20. (Original). The method of claim 16 wherein said immunogen is a pathogen antigen.

21. (Original). The method of claim 16 wherein said immunogen is an antigen associated with an autoimmune disease.

22. (Original). The method of claim 16 wherein said immunogen is an antigen associated with a hyperproliferative disease.

23-40. Cancelled

41. (New). A composition comprising a plasmid of claim 11 further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

42. (New). The nucleic acid molecule of claim 1 wherein said protein comprises part of CD80 C region.

43. (New). A plasmid comprising a nucleic molecule of claim 42.

44. (New). A plasmid of claim 43 further comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.
45. (New). A composition comprising a plasmid of claim 44 further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.
46. (New). A composition comprising a plasmid of claim 43 further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.
47. (New). A recombinant vaccine or attenuated vaccine comprising composition comprising a nucleic acid molecule of claim 42.
48. (New). A methods immunizing an individual against an immunogen comprising administering a composition comprising nucleic acid molecules according to claim 42.
49. (New). The method of claim 48 wherein said immunization is prophylactic.
50. (New). The method of claim 48 wherein said immunization is therapeutic.
51. (New). The method of claim 48 wherein said immunogen is an allergen.
52. (New). The method of claim 48 wherein said immunogen is a pathogen antigen.

53. (New). The method of claim 48 wherein said immunogen is an antigen associated with an autoimmune disease.

54. (New). The method of claim 48 wherein said immunogen is an antigen associated with a hyperproliferative disease.

55. (New). A nucleic acid molecule that comprises a coding sequence operably linked to regulatory elements, wherein said coding sequence encodes a CD80 mutant that comprises a functional CD80 V region, a functional CD80 tm and a functional CD80 ct region, and is free of a functional C region by the absence of all or part of the CD80 C region; wherein said CD80 does not transmute the negative signal associated with wild-type CD80 C region interactions with CTLA4.

56. (New). A plasmid comprising a nucleic molecule of claim 55.

57. (New). A plasmid of claim 55 further comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

58. (New). A composition comprising a plasmid of claim 57 further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

59. (New). A composition comprising a plasmid of claim 56 further comprising an immunogenic protein or a plasmid comprising a nucleic acid sequence comprising a coding sequence encoding an immunogen, said coding sequence operably linked to regulatory elements.

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60. (New). A recombinant vaccine or attenuated vaccine comprising composition comprising a nucleic acid molecule of claim 55.

61. (New). A methods immunizing an individual against an immunogen comprising administering a composition comprising nucleic acid molecules according to claim 55.

62. (New). The method of claim 61 wherein said immunization is prophylactic.

63. (New). The method of claim 61 wherein said immunization is therapeutic.

64. (New). The method of claim 61 wherein said immunogen is an allergen.

65. (New). The method of claim 61 wherein said immunogen is a pathogen antigen.

66. (New). The method of claim 61 wherein said immunogen is an antigen associated with an autoimmune disease.

67. (New). The method of claim 61 wherein said immunogen is an antigen associated with a hyperproliferative disease.